

Remarkable Instances of Crustacean Parasitism.

By A. E. VERRILL.

In a collection of about ninety specimens of a small sea-urchin (*Euryechinus imbecillis*, Verrill) from the coast of Peru, not one could be found in which the anal area and surrounding parts of the upperside of the shell were not more or less irregularly distorted or imperfect. An examination of the interior showed that in each specimen a crab (*Fabia chilensis*, Dana), allied to the common crab of the oyster (*Pinnotheres ostreae*), had effected a lodgment in the upper part of the intestine, which had thereby been greatly distended in the form of a membranous cyst, attached to one side of the shell, and extending around to the lower surface near the mouth. The shell is usually swollen on the side over the cyst; and the anal area is depressed and distorted, with a large open orifice passing obliquely into the cyst, out of which the crab may thrust its legs at pleasure, but is apparently unable, when full-grown, to come entirely out. All the specimens examined in the cyst were females, carrying eggs; but a very small crab found clinging among the spines appears to be the male. The crab probably effects an entrance into the intestine through the anus while quite young, and, by its presence and growth in that position, causes the gradual distortion of the shell and formation of the cyst. In Prof. Dana's Report on the Crustacea of the U. S. Expl. Expedition this crab is described as from Valparaiso, from an *Echinus*; but no special notice of its mode of occurrence and remarkable frequency appears to have been published*.

Another peculiar mode of parasitism I have observed in a singular crustacean (*Hapalocarcinus marsupialis*, Stimpson†) from the Sandwich Islands. This creature lodges itself among the slender branches of a coral (*Pocillipora caespitosa*, Dana) and causes, probably by its incessant motions, the branches to grow up and surround it on both sides by flat expansions of coral, terminating in digitations which often interlock above, leaving openings between them suitable for the uses of the parasite, but usually too small to allow of egress. Most specimens of the corals of this species sustain one or more, and often numerous, examples of these curious enlarged bulbs among the branches. The habits were unknown to Dr. Stimpson when he described his specimens, which had dropped from among recently collected corals.—*Silliman's American Journal*, July 1867.

On the Anatomy of Balanoglossus (Delle Chiaje).

By A. KOWALEWSKY.

Under the name of *Balanoglossus*, Delle Chiaje described a vermiform animal of the Bay of Naples, known to the fishermen under the name of *lingua di bue*. It has since scarcely attracted any attention

* *Pinnaxodis hirtipes*, Heller, recently described from Ecuador and found in an *Echinus*, is probably the same species.

† Proceedings Boston Soc. Nat. Hist. vi. 412.

from naturalists; and the very incomplete investigation of it made in 1860 by M. Keferstein taught us nothing of importance about it.

The *Balanoglossi* nevertheless constitute one of the most curious of animal types, the position of which in the zoological scale is not easy to fix. This appears evidently from the fine work of M. Kowalewsky.

The body in the *Balanoglossi* (of which two species exist at Naples) is vermiform and composed of a series of successive regions. The foremost, separated by a constriction from the following one, has all the appearance of a head; but a careful examination shows that it possesses none of the characters which would justify that name. It is no doubt a tactile organ, to which M. Kowalewsky gives the name of trunk. It is followed by a sort of muscular collar bearing the mouth underneath. The succeeding region is much longer, and may be designated the branchial region. We shall recur immediately to its singular structure. Further back the body bears upon its back two rows of glands (the sexual glands), and then numerous papillæ, which Delle Chiaje took for respiratory organs, but which in reality contain blind processes of the intestinal canal: this, therefore, might be called the hepatic region. Lastly, the terminal or caudal region is smooth and finely annulated.

The most remarkable peculiarity of the *Balanoglossi* is the structure of the respiratory apparatus. The water which serves for the oxygenation of the blood penetrates by the mouth and issues upon the back of the animal by two series of apertures placed upon the sides of the branchial region. It traverses a very complex branchial apparatus, sustained by a chitinous skeleton. This skeleton is formed by two symmetrical series of vertical transverse plates, united in threes by small rods perpendicular to the direction of the plates. The whole therefore constitutes a double series of frames, upon which ramify the blood-vessels, covered by an epithelial layer. The openings of the frames are covered with vibratile cilia. The water, after penetrating by the mouth into the pharynx, gets entangled in the respiratory frames, and issues by the orifices which we have mentioned, the number of which is equal to that of the frames.

It is impossible, in our opinion, not to be struck by the great resemblance of this apparatus to the branchial apparatus of the Vertebrata. Certain anatomists have already attempted a comparison of the *Ascidia* with the Vertebrata, in consequence of their singular respiratory apparatus; but in this case the resemblance is very much greater.

No doubt, in other respects, the analogy with the Vermes is striking, especially as regards the facies of the animal and the central portions of the vascular system reduced to two principal trunks—a dorsal vessel driving the blood from behind forwards, and a ventral vessel conveying it in an opposite direction, &c. Nevertheless it appears to be impossible to ascribe to these animals, as M. Keferstein has done, a place among the Nemertida, or especially to approximate them to the Annelida, as M. Kowalewsky would do. For the present it is necessary to elevate the *Balanoglossi* into a

separate class among the Vermes, through which the latter will as it were hold out a hand to the Vertebrata, as already, by other types, to the Infusoria, Echinodermata, Mollusca, and Arthropoda. The group of Vermes is daily showing more and more the character of being the origin of all the animal kingdom.—*Mém. Acad. Imp. de St. Pétersb.* 1866; *Bibl. Univ.* 1867, *Arch. Sci.* pp. 249–251.

On the external characters of the Young of the Central American Tapir (Elasmognathus Bairdii, Gill). By A. E. VERRILL.

This remarkable animal has hitherto been known only by its skull, and a skeleton, not entirely complete, belonging to the Smithsonian Institution. The Museum of Yale College has recently been so fortunate as to receive from J. H. Sternberg, Esq., a specimen of the young animal, preserved entire in alcohol. This individual is a female, and is supposed by Mr. Sternberg to have been about three months old in April. He states that its weight is not more than that of the head of the adult, one head that he formerly examined weighing 82 pounds.

Its entire length is 31 inches; nose to occiput 11; nose to eye 4.25; nose to incisor teeth 1.5; eye to ear 3.2; lower jaw 6.5; length of ear 3.5; breadth 2.5; tail from vent, not including hair, 2. The legs are short and stout; the tail small and inconspicuous. The head, viewed from the side, is elongated oval, from above elongated triangular, the sides nearly straight, the nose truncated. In advance of and above the eyes the sides of the nose are compressed and concave, with a slight depression on its ridge. Beyond this the snout is enlarged, and convex both on the sides and above; the tip papillöse and slightly decurved, which gives it a truncated appearance. The nostrils are large, oval, placed obliquely at the end of the nose, about half an inch long, the inner angles separated about a quarter of an inch, the margins thickened. The nose itself is quite flexible and, apparently, capable of extension. The ears are large and prominent, broad oval, rounded at the end. The hair is rather fine and soft, about an inch long on the body, and half as long on the head, where it is not so thick.

The general colour is bright reddish brown, the head darker above. The lips and end of the nose, bordering the naked black tip, are white. Five interrupted narrow white stripes pass along each side of the nose, the upper one extending over and beyond the eye. The cheeks have several larger patches of whitish, one of which is under the eye; a larger white spot is on the throat. The ears are dark brown, lighter at the outer base, the tips and several unequal spots on the outside white. The back and sides are marked by longitudinal rows of yellowish-white patches, which partially blend into continuous stripes on the sides. There are in all about ten of these stripes. The underside of the body is uniform yellowish grey. The legs are darker brown than the body, and marked by numerous transverse bands and spots of white.—*Silliman's American Journal*, July 1867.